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# LOGO! 8 TDE Central control for individual switching of general consumers

LOGO! 8  
LOGO! Soft Comfort V8.2

<https://support.industry.siemens.com/cs/ww/en/view/109755864>

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# 1 Introduction

This application example offers a ready-made circuit for LOGO! 8 for the control of up to 20 different functions in a building via the function keys of the external LOGO! text display.

The integrated functions of a LOGO! 8 offer many additional possibilities to solve tasks in building management quickly and easily.

With LOGO!, prefabricated function blocks support project creation, e.g. weekly time switch, pulse generator, astro timer, seasonal time switch, stopwatch and simple logic gates.

The LOGO! text display (TDE) and the integrated web server of the LOGO! 8 offer additional options for operation and monitoring using function keys and message texts. This enables you to call up and control functions via the Internet; please refer to the individual security requirements "Security Notes".

## Task

The LOGO! TDE is designed to navigate easily through the switchable facilities inside and outside a building. This central control system is intended to enable connection to a network in order to switch functions on and off, e.g. via a smartphone/tablet, as shown by [Figure 1-1](#).

Figure 1-1: Central control with the LOGO! TDE in building automation



## Advantages of LOGO! due to a conventional electrical installation

The simple integration of LOGO! 8 offers you the following benefits:

- Extendibility of the software program to include further tasks (room lighting, staircase lighting, safety and monitoring functions, etc.)
- Straightforward, star-shaped wiring of the components
- Use of simple switches (circuit breakers) or pushbuttons instead of complex toggle or two-way switches
- Integration of LOGO! inputs and outputs into a KNX system

## Target group

This application example is intended for specialist staff for electronics engineering.

### **Possible uses of the application example:**

There are different scenarios depending on the purpose and use of a building. The following functions are conceivable for a residential building; these can be controlled using the menu navigation in this application example:

- In the building:
  - Switching lamps on/off
  - Raise/lower roller blinds and Venetian blinds (2 outputs required)
  - Switching on/off power sockets (coffee machine, diverse household appliances)
  - Alarm system (switching to different operating modes)
  - Open/close window/s
  - Switching ventilation on/off
  - Fish tank (automatic feed unit on/off)
  - Heating/air conditioning with digital or analog input (Module for analog value output required)
  
- Around the house or in the garden:
  - Motion detector, switching on/off camera system
  - Watering the garden (automatic operation, manual control)
  - Lighting (timer, switching on/off)
  - Switching pool heating / pump on/off

## 2 Structure and description

### 2.1 Components used

This application example includes two extension levels for your project.

The basic example uses only the LOGO! basic unit, with 4 switchable outputs, and is preferably used to illustrate the switching program. The simulation function of LOGO! Soft Comfort is available for this purpose. You can expand this switching program.

For the expanded example the maximum configuration with 20 switchable outputs was configured for LOGO! The advantage for you is that you shorten the switching program according to your application in line with Chapter [4.2.5](#).

The Application Example was created with the components from [Table 2-1](#).

Table 2-1: Hardware and software components for the application example

Component	Number	Article number	Note
LOGO! Soft Comfort V8.2 DVD	1	6ED1058-0BA08-0YA1	You will find an upgrade to V8.2 at: <a href="https://www.siemens.com/global/en/home/products/automation/systems/industrial/plc/logo.html">https://www.siemens.com/global/en/home/products/automation/systems/industrial/plc/logo.html</a>
LOGO! 230RCE	1	6ED1052-1FB08-0BA0	230V version with 4 relay outputs
LOGO! TDE	1	6ED1055-4MH08-0BA0	Optional components
Extensions	Number	Note concerning the maximum extension of LOGO!	
LOGO DM8 230R	2 <sup>(1)</sup>	6ED1055-1FB00-0BA2	4 relay outputs
LOGO DM16 230R	1 <sup>(1)</sup>	6ED1055-1FB10-0BA2	8 relay outputs

<sup>(1)</sup> You can replace two identical DM8 expansion modules with one DM16 expansion module of the same type (and vice versa) without changing the circuit program.

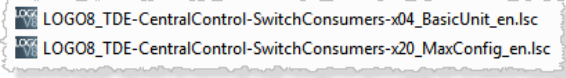
The components used are LOGO! 8 for 230V with the corresponding expansion modules for 230V. The connection diagram and further indications can be seen in Chapter [3.3](#).

#### Note

However, you have the possibility to create other configurations, e.g. with 24V devices. Mixed operation, as described in Chapter [3.4](#), is also possible.

This application example consists of these instructions and two LOGO! switching programs for 4 (basic device) and 20 (maximum configuration) digital outputs.

Table 2-2: Connectors for our application example

Component	File name	Note
Documentation	109755864_LOGO8_TDE-CentralControl-SwitchConsumers_en.docx	-
LOGO! 8 Programs	109755864_LOGO8_TDE-CentralControl-SwitchConsumers_en.ZIP 	Requirement: LOGO! Soft Comfort V8.2

## 2.2 LOGO! expansions

A wide range of expansion modules is available for the LOGO! to individually expand your configuration. In this application example only digital expansion modules are used on a LOGO! 8.

The maximum expansion of a LOGO! 8 depends on the basic device; a network configuration enables more comprehensive configurations.

This is the quantities structure for the maximum possible expansion, [Table 2-3](#).

Table 2-3: Maximum Configuration of LOGO! 8 control

Number For a (LOGO!)	Number of LOGOS!s in the network	Abb r.	Designation	Description
24	88 <sup>(1)</sup>	I	Input	Digital inputs
20	80 <sup>(1)</sup>	Q	Output	Digital outputs
8 <sup>(2)</sup>	40 <sup>(1)(2)</sup>	AI	Analog input	Analog inputs
8 <sup>(2)</sup>	24 <sup>(1)(2)</sup>	AQ	Analog output	Analog outputs

(1) If your requirement includes further in- and outputs, you can join together several LOGO! 8 or LOGO! 7 in a network. Via a master/slave configuration, you can combine up to (88 DI, 80 DQ, 40 AI and 24 AQ) in one circuit program.

(2) In this application example no analog modules are used!

For specific information about LOGO! output modules, please refer to the LOGO! manual or the following website:

- [https://w3.siemens.com/mcms/programmable-logic-controller/en/logic-module-  
logo/modular-expansion-modules/Pages/Default.aspx](https://w3.siemens.com/mcms/programmable-logic-controller/en/logic-module-logo/modular-expansion-modules/Pages/Default.aspx)

### 2.2.1 LOGO! TDE

The LOGO! TDE external text display for LOGO! 8 provides you with an inexpensive and central user interface for your applications. You have the possibility to adjust parameters and use the LOGO! TDE for troubleshooting.

The configuration of LOGO! TDE is done using the same function block as for the internal display.

The use of the TDE allows the display of all messages via the integrated web server and thus also the control of applications via a smartphone.

## 3 Commissioning

This Chapter includes basic information on the commissioning of the LOGO! 8 applied here. For further information on mounting and wiring, use the LOGO! 8 manual and follow the connection instructions in the product information supplied with your device.

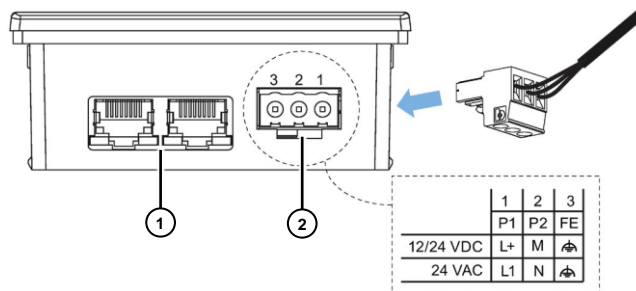
### 3.1 Connecting LOGO! TDE

The LOGO! TDE must be operated with a voltage of 12V DC or 24V AC/V DC and is installed separately. Siemens recommends protecting the LOGO! TDE by means of an 0.5 A fuse at the power supply.

The voltage connection is not polar. If you connect a DC power supply to the LOGO! TDE, you can connect the positive supply line or the negative supply line according to [Figure 3-1](#) (2) either to pin 1 or to pin 2. Pin 3 must be connected to earth.

Communication to LOGO! takes place via the Ethernet interface (1).

Figure 3-1: Hardware structure for application example



### 3.2 Wiring the LOGO!

When wiring up LOGO!, use a screwdriver with a blade 3 mm in width. Wire-end ferrules are not required for the terminals.

You may use conductors that fulfill the following requirements:

- Cross sections of up to  $(1 \times 2.5 \text{ mm}^2)$  or  $(2 \times 1.5 \text{ mm}^2)$  for every other terminal chamber
- Wiring material: Cu
- Nominal insulation temperature: 75 °C
- Tightening torque: From 0.5 Nm to 0.6 Nm or 4.5 in.lbf to 5.3 in.lbf.


#### Notes

1. LOGO! is a switching device with protective insulation. You must connect the FE terminal to earth.
2. After installation, the terminals must be covered. To protect LOGO! sufficiently against inadmissible contact with live parts, the country-specific standards must be observed.
3. A metal oxide varistor (MOV) can be used for voltage peaks on the supply line. Make sure that the operating voltage of the varistor is at least 20 % higher than the nominal voltage (e.g. S10K275).



### 3.3 Connecting LOGO! and the digital modules to 230 V

#### Multi-phase operation

 <b>CAUTION</b>	<p><b>Not observing the following instructions can lead to injury!</b></p> <p>The expansion modules DM8 230R and DM16 230R must be operated with the same type of power supply (DC or AC) as the connected 230V version of the LOGO! basic module!</p> <p>The same supply output "+/-" (direct voltage) or "N/L" (alternating voltage) must be connected to the same phase on both the DM8/16 230R expansion module and the connected LOGO! basic unit!</p>
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The LOGO! 230RCE features 8 digital inputs in two groups.

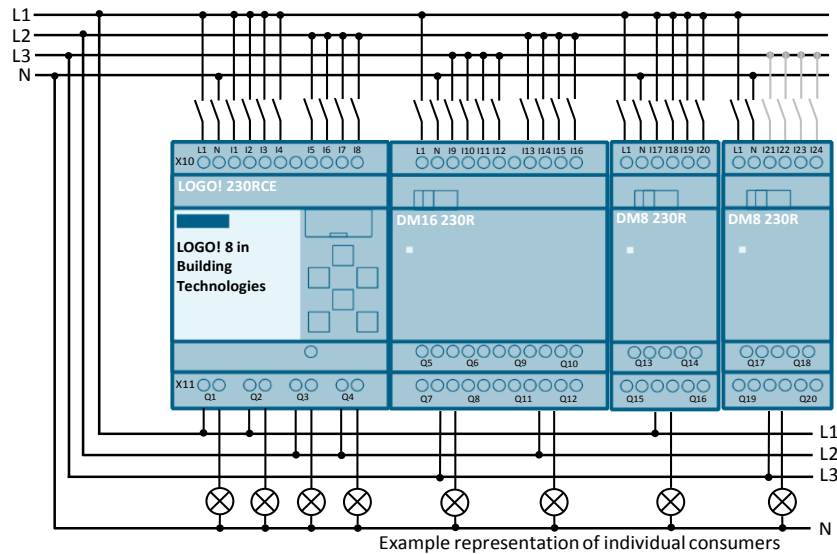
Within a group, the same phase must be used at all inputs. Different phases are only possible between the groups!

This means that you use the four inputs [I1-I4] on phase L1 and the four inputs [I5-I8] on phase L2 according to [Figure 3-2](#), for example.

The digital module DM16 230R is also divided into two groups.

Digital modules can only be connected to devices with the same voltage class, here 230V for the LOGO! 230RCE.

Figure 3-2: Multi-phase operation with one basic device and four digital modules



**Note**

This application example provides the maximum configuration for a LOGO! 8 with 20 outputs. However, only 20 inputs are used for switching. [I21] to [I24] are not used!

### 3.4 LOGO! Extensions in 24V and 230V mixed operation

Digital modules can only be connected to devices with the same voltage class.

If you want to use different voltage levels 230V/24V in a LOGO! configuration, the base unit must be a 230V variant.

Initially, 230V modules come in the expansion. After these modules, it is imperative to use an analog module (to be chosen freely) in order to effect the galvanic isolation. After the galvanic isolation has been made by the analog module, you can use further analog modules or 12/24V digital modules. You can find additional information in the LOGO! manual.

#### 3.4.1 Commissioning the Application Example

Proceed as follows:

1. Start the LOGO! Soft Comfort V8.2
2. Open the supplied LOGO! example program \*.lsc
3. Transfer the program to LOGO!

#### Note

In the application example, the IP address 192.168.0.1 has been preset for LOGO!

You will find a description of the general procedure for assigning the IP address of a LOGO! 8 in Chapter: [3.8.1 "Configuring Network settings"](#).

## 4 Mode of operation

This application example provides two versions of a LOGO! switching program with the same function for the LOGO! Soft Comfort software.

In the basic switching program, only the four LOGO! integrated outputs are used and navigated via the TDE. This reduced switching program simplifies the understanding of the operating principle.

Up to 20 digital outputs are used in the extended switching program. This corresponds to the maximum configuration of the control system, which allows up to 20 functions to be switched in the building.

If you want to switch less functions, delete the unnecessary program parts from the switching program, in line with Chapter [4.2.5](#)

### Note

You will find a function description of the corresponding circuit as a comment on the switching program under LOGO! Soft Comfort:

> "File" > "Properties" > "Comment"

**Hint:** Select "Extras" > "Options" > "Print" and check the "Comment" box to print the function description together with the program.

## 4.1 Basic switching functions (LOGO! basic device)

The basic switching program illustrates how the circuit works, clearly arranged on one page, as shown in [Figure 4-1](#).

Use the LOGO! Soft Comfort simulation function and follow the course of the red switching signals when actuating the corresponding buttons in the LOGO! switching program.

The four function keys of the LOGO! TDE are parameterized. You scroll through the functions and select the respective output [Q] to switch a function on or off. Each digital output, e.g. [Q1], can also be selected directly by a digital input [I1].

### [F1] and [F2] function keys (Function ON / OFF)

With the function keys [F1] and [F2] you switch each output of the LOGO! on and off. The function of the output is described in the corresponding message texts.

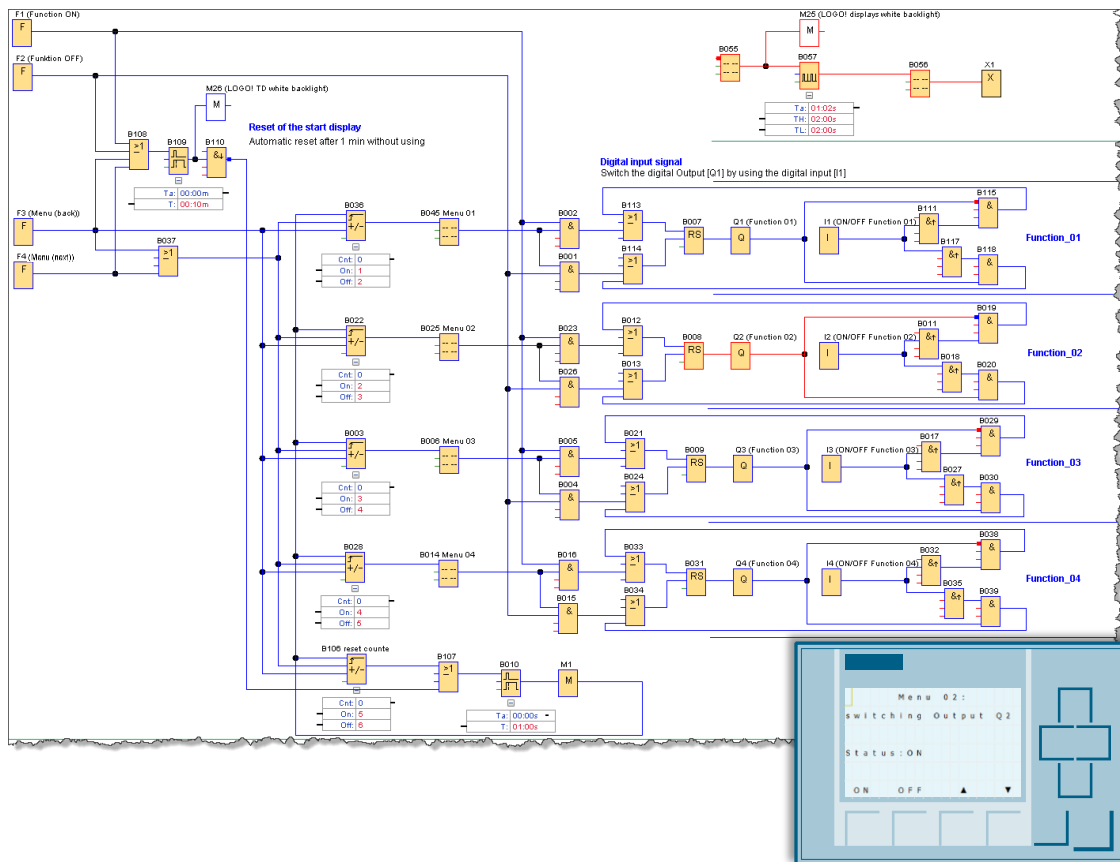
### [F3] and [F4] function keys (back / next)

With the [F4] function key you scroll forward to the next function and with [F3] you scroll back one function.

When you have scrolled to the last menu item (message text), if you press [F4] again the display returns to the initial screen.

If no key is pressed within 10s, the display also returns to the initial screen.

Figure 4-1: Selection of functions via the function keys on the LOGO! TDE

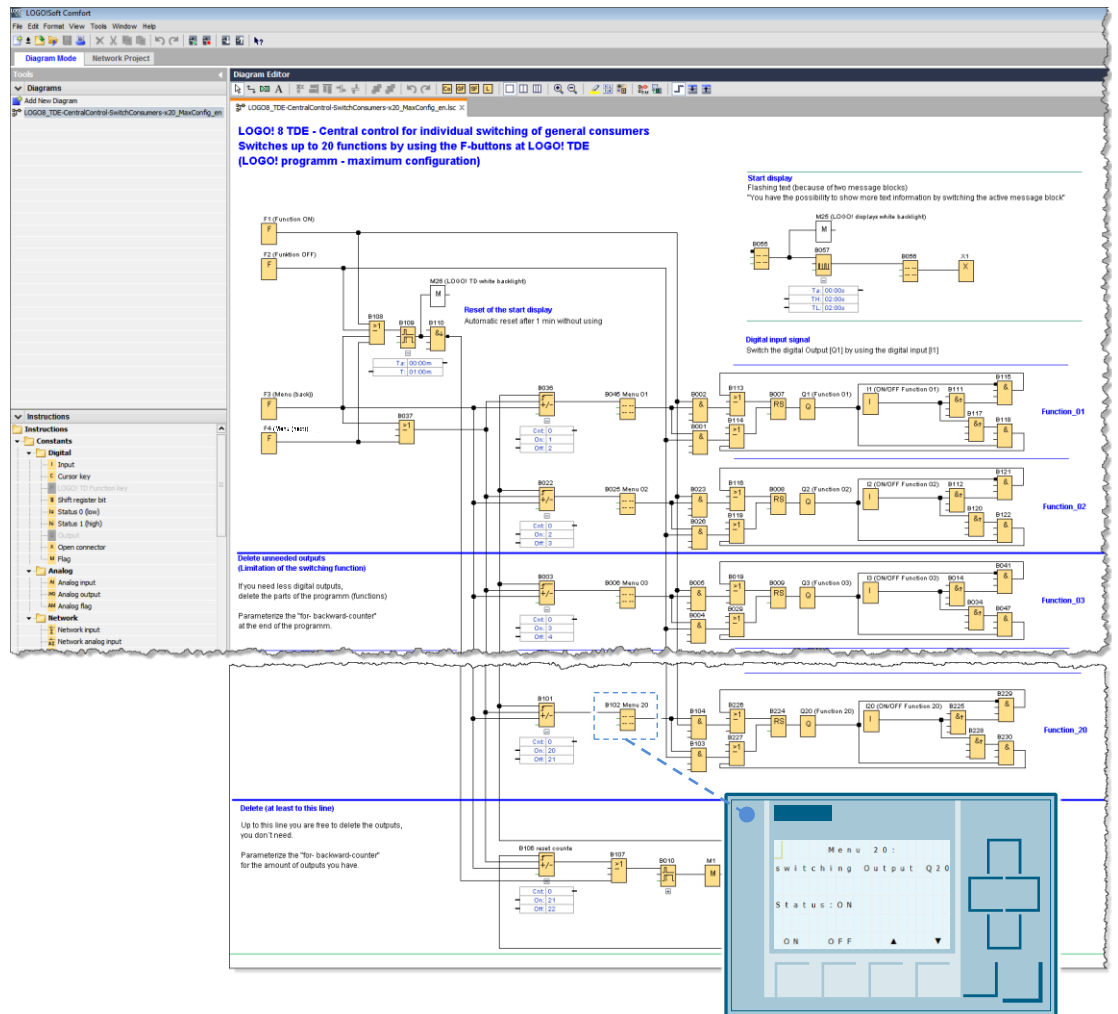


## 4.2 Expanded circuit structure

The expanded circuit program from [Figure 4-2](#) shows how you can control individually up to 20 digital outputs [Q1-Q20] of a hardware configuration in the configured menu sequence for the TDE using the message text function.

In the circuit program itself, you will find a brief explanation of the functions of the respective sub-functions.

Figure 4-2: Selection of up to 20 functions via the LOGO! TDE function keys



### 4.2.1 Switching the Message texts and switching the outputs

Each LOGO! output is assigned to a message text that describes the respective output function, as [Figure 4-3](#) shows.

The message texts are in turn activated by a forward and backward counter connected upstream.

In the figure, the counter [B096] switches at the 19th pulse of key [F4] (=counter value On: 19) on and at (counter value Off: 20) off again.

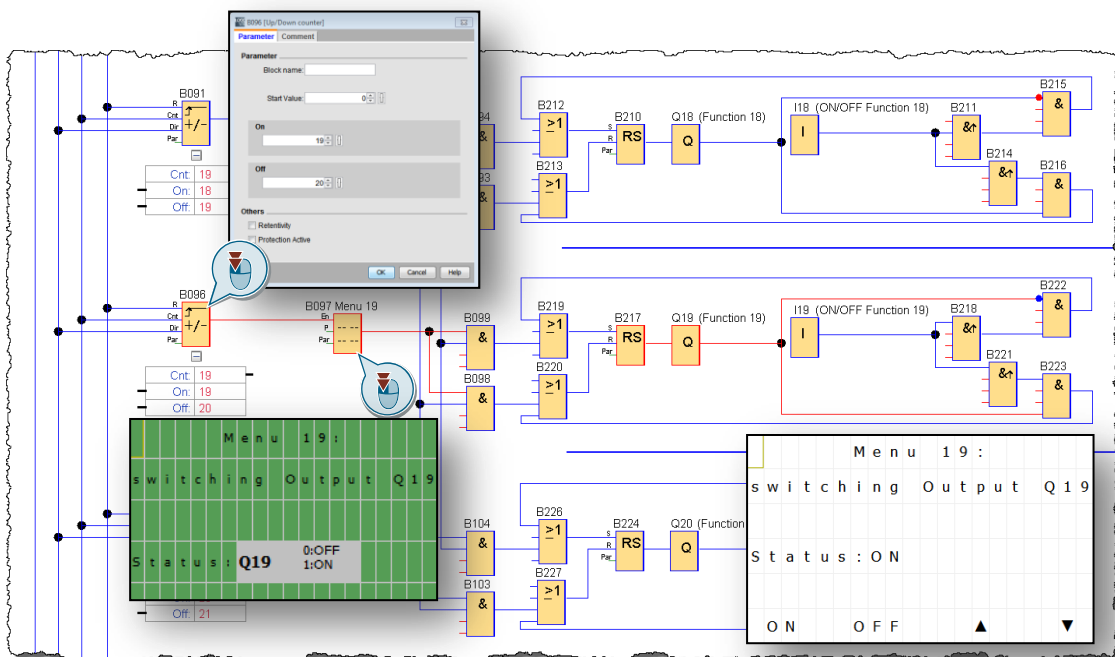
If you press [F1] to switch on the output, the self-latching relay [B100] is activated via the AND block [B099] and thus the output [Q19] is switched on.

If you continue actuating the [F4] key, output [Q19] remains active through the self-latching relay and is only deactivated by a reset signal [F2].

Output [Q19] is alternately switched on and off via digital input [I19]. When an input is activated, the self-retaining relay [B217] is set via the rising flank at AND block B218] and [Q19] is switched on. The self-retaining relay is reset by a further flank.

You can access the windows for parameterizing the blocks by double-clicking on the respective block.

Figure 4-3: Switching function of the message texts

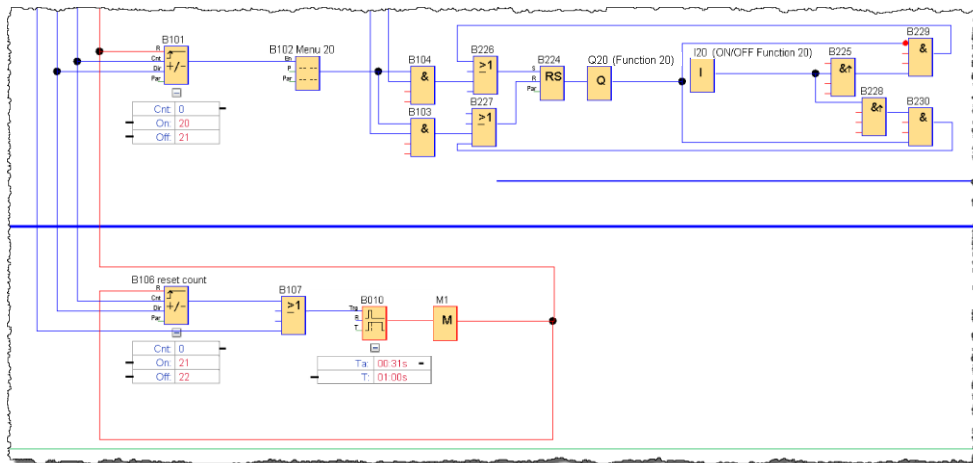


### 4.2.2 Menu – Jumping back to initial screen of the message texts

If you reach the final message text (output) with the function key [F4] and then press [F4] again, the counter [B106] is set. The subsequent OR block [B107] forwards the signal to the OFF delay [B010], here set to one second.

The subsequent marker [M1] is required to return the signal of a string to an input of the same string, in this example the reset inputs of the counters. This resets all counters and restarts the menu navigation from the initial screen.

Figure 4-4: End of message texts and jump to initial screen / start screen

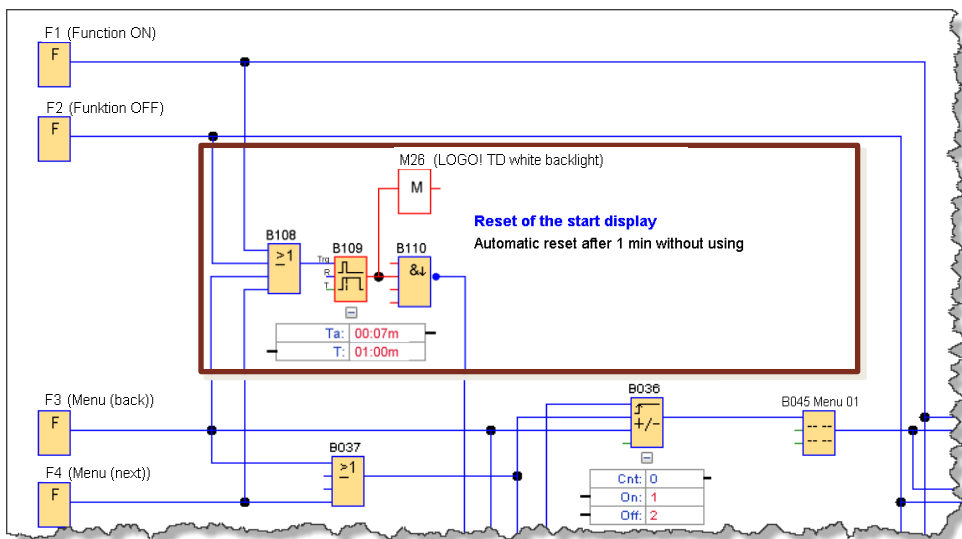


### 4.2.3 Menu – Automatic jump back to initial screen after inactivity

As soon as one of the function keys on the LOGO! TDE is pressed (Figure 4-5), the OR block [B108] and the switch-off delay [B109] switches the backlight of the LOGO! TDE display to white [M26].

The subsequent block [B110] (NAND with flank evaluation) sends a pulse to the reset inputs of all counters as soon as the switch-off delay [B109] preset time has elapsed. In the example, the message text display returns to the initial screen after one minute of inactivity.

Figure 4-5: Automatic return jump to initial screen after inactivity



### 4.2.4 Periodic screen change of the initial screen

The start screen of the message text block [B055] is activated by the input (enabled) and, through the marker [M25], switches the white background illumination of the LOGO! display on.

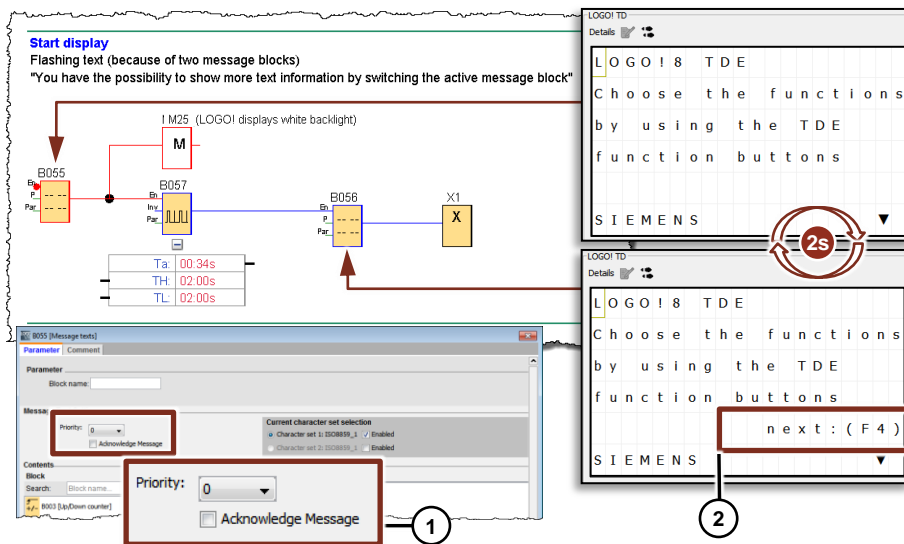
The subsequent pulse generator [B057] is activated, whereby the pulse/pause ratio is 2s each. This switches on the second message text of the source screen for 2s every 2s.

If several message texts are active at the same time, the message text with the higher priority is displayed at position (1), as [Figure 4-6](#) shows.

As a result, the display of the message texts (2) changes and a flashing text appears: "Next: (F4)".

Alternatively, you can use this method to display changing message texts with complementary information.

Figure 4-6: Periodic screen change of the initial screen





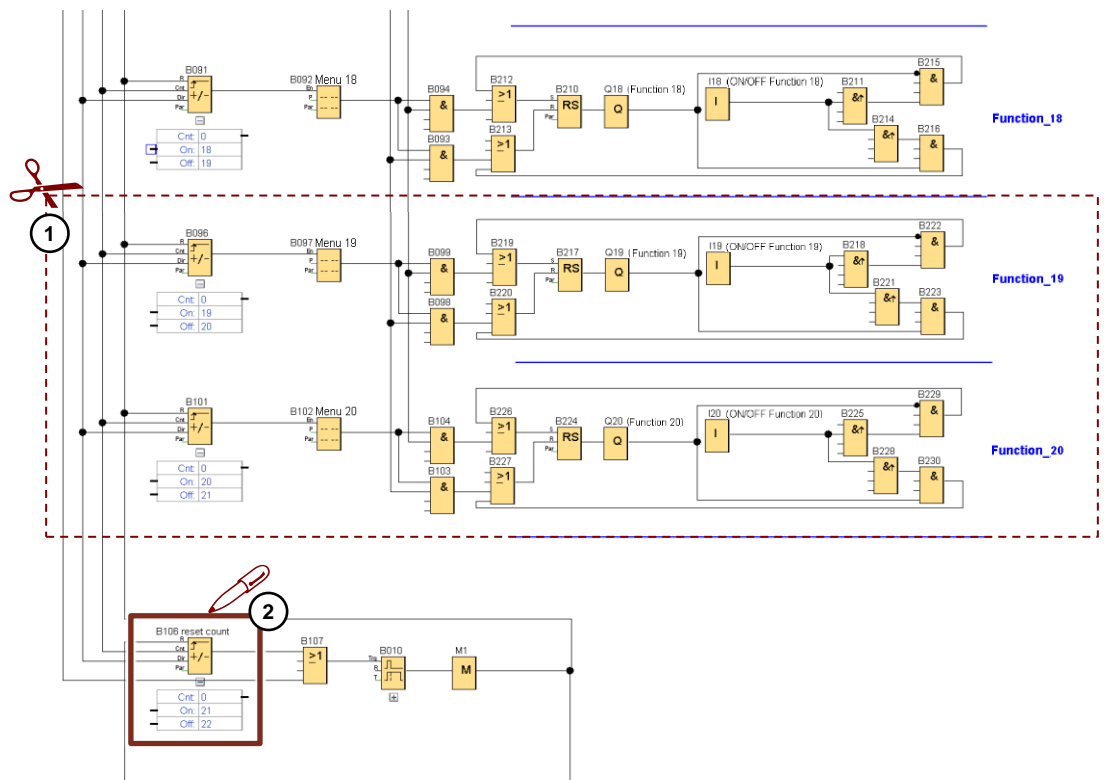
### 4.2.5 Adjustments to the switching program

If you use fewer outputs within the navigation, remove the irrelevant program components [Figure 4-7](#) (1) from the LOGO! switching program and adjust the parameters of the final up/down counter (2).

In the following example, 18 digital outputs are to be connected.

1. Remove the circuit components of functions 20 and 19.
2. Parameterize the final counter [B106] with (On: 19) and (Off: 20).  
General rule: (On: last Output + 1; Off: last Output + 2)

Figure 4-7: Reduction of outputs in the LOGO! switching program



**Note**

It is recommended to remove the program parts in descending order of the outputs, i.e. first [Q20], then [Q19], etc. If you want to remove only certain outputs between Q1 and Q20, it is necessary to parameterize the corresponding forward and reverse counters.

## 5 Appendix

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### 5.2 Links and Literature

Table 5-1: Links and Literature

No.	Topic
\1\	Siemens Industry Online Support <a href="https://support.industry.siemens.com">https://support.industry.siemens.com</a>
\2\	This article <a href="https://support.industry.siemens.com/cs/ww/en/view/109755864">https://support.industry.siemens.com/cs/ww/en/view/109755864</a>
\3\	LOGO! 8 User Manual <a href="https://support.industry.siemens.com/cs/ww/en/view/109755864">https://support.industry.siemens.com/cs/ww/en/view/109755864</a>
\4\	LOGO! logic module (Application examples, expansion modules) <a href="https://www.siemens.com/global/en/home/products/automation/systems/industrial/plc/logo.html">https://www.siemens.com/global/en/home/products/automation/systems/industrial/plc/logo.html</a>

### 5.3 Change documentation

Table 5-2: Change documentation

Version	Date	Change
V1.0	04/2018	First edition